Multi-scale ordering of aragonite skeletal growth in the cold-water coral Lophelia pertusa

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Colonial Scleractinian cold-water coral (CWC) skeletons provide the opportunity to study environmental variations over extended periods of time at high (infra-annual) resolution through the use of geochemical proxies. Interpretation of analytical transects following skeletal growth is, however, challenging as a temporal calibration of cold-water coral skeletons is not yet fully established.

In order to better characterize growth patterns of CWC, we used electron backscatter diffraction (EBSD) on a *Lophelia pertusa* specimen. Results indicate several orders of organization of coral growth controlled by the orientation of aragonite fibres from distinct centres of calcification. These centres are ordered in superimposed planes and the development of fibres is governed by crystal growth competition. Such a non-linear skeletal growth results in a temporal discontinuity of growth patterns in adjacent areas of the coral skeleton.